

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A process of removing suspended and dissolved protein-containing material from fruit and vegetable wastewater comprising the steps of:

adding an inorganic coagulant polymer to the wastewater to create a charge interaction wherein coagulated solid particles are formed from the suspended and dissolved material in the wastewater; ~~and~~

adding a synthetic organic polymer to the wastewater to neutralize all the coagulated solid particles into a plurality of nontacky solid particles each having a size ranging from 15 to 150 microns, wherein the synthetic organic polymer is added in an amount between a 5:1 and 25:1 ratio of inorganic coagulant polymer to synthetic organic polymer, and wherein the dwell time is between 5 and 30 minutes; and

passing the wastewater through a microfiltration membrane to separate the solid particles from the wastewater, wherein the separated solid particles comprise protein.

Claim 2 (Original): The process as recited in claim 1, wherein the coagulant polymer is selected from the group including: an aluminum compound having a charge of +3, an iron based compound having a charge of +3 and a calcium compound.

Claim 3 (Original): The process as recited in claim 2, wherein the aluminum based compound is selected from the group including: aluminum chloride, aluminum sulfide, poly aluminum chloride and aluminum chlorohydrate.

Claim 4 (Original): The process as recited in claim 2, wherein the iron based compound is selected from the group including: ferric sulfate and ferric chloride.

Claim 5 (Previously Presented): The process as recited in claim 1, wherein the coagulant polymer is added in an amount that is based upon a quantity of TSS, BOD and COD determined to be in the wastewater.

Claim 6 (Original): The process as recited in claim 1, wherein the coagulant polymer is added in an amount that is approximately equal to: $20 * ((\text{BOD Qty} + \text{COD Qty} + (0.35 * (\text{TSS Qty}))) / 1000)$, wherein the BOD Qty, COD Qty and TSS Qty represent the corresponding amounts of BOD, COD and TSS in the wastewater.

Claim 7 (Original): The process as recited in claim 1, wherein the coagulant polymer is a basic coagulant polymer when the pH of the wastewater is low and is an acidic coagulant polymer when the pH of the wastewater is high.

Claim 8 (Original): The process as recited in claim 1, wherein coagulant polymer is added in an amount between 50 to 200 ppm.

Claim 9 (Cancelled)

Claim 10 (Previously Presented): The process as recited in claim 1, wherein the synthetic organic polymer is selected from the group including: DADMAC and epi-dma.

Claim 11 (Previously Presented): The process as recited in claim 1, wherein the synthetic organic polymer is epi-dma.

Claim 12 (Previously Presented): The process as recited in claim 1, wherein the synthetic organic polymer is an organic polymeric backbone having a molecular weight in the range of 150,000 to 500,000 atomic mass units.

Claim 13 (Cancelled).

Claim 14 (Original): The process as recited in claim 1, wherein the synthetic organic polymer is added in an amount between 10 to 50 ppm.

Claim 15 (Cancelled)

Claim 16 (Cancelled).

Claim 17 (Original): The process as recited in claim 1, wherein the filtering is performed by a polypropylene filter membrane.

Claim 18 (Previously Presented): The process as recited in claim 17, wherein the wastewater flows through the filter membrane from an outside of the filter membrane to an inside of the filter membrane.

Claim 19 (Original): The process as recited in claim 1, further comprising the step of adding a pH adjuster to the wastewater to adjust the pH of wastewater and to remove sulfates.

Claim 20 (Original): The process as recited in claim 19, wherein the pH adjuster is Mg(O).

Claim 21 (Currently Amended): A process of removing suspended and dissolved protein-containing material from fruit and vegetable wastewater comprising the steps of:

adding the wastewater to a tank;

determining an amount of BOD, COD and TSS in the wastewater;

adding simultaneously to the wastewater in the tank:

an inorganic coagulant polymer to the wastewater creating a charge interaction wherein coagulated solid particles are formed from the suspended and dissolved material in the wastewater, wherein the amount of the inorganic coagulant polymer is approximately equal to: $20 * ((\text{BOD Qty} + \text{COD Qty} + (0.35 * (\text{TSS Qty}))) / 1000)$, where the BOD Qty, COD Qty and TSS Qty represent the corresponding amounts of BOD, COD and TSS in the wastewater;

a synthetic organic polymer to neutralize all the coagulated solid particles into nontacky solid particles having a size ranging from 15 to 150 microns, wherein the amount of synthetic organic polymer added is between a 5:1 and 25:1 ratio of coagulant polymer to synthetic organic polymer; and

passing the wastewater through a microfiltration membrane to separate the solid particles from the wastewater, wherein the separated solid particles comprise protein.

Claim 22 (Original): The process as recited in claim 21, wherein the coagulant polymer is selected from the following group of compounds: an aluminum based compound having a charge of +3, an iron compound having a charge of +3, and a calcium compound.

Claim 23 (Previously Presented): The process as recited in claim 21, wherein the synthetic organic polymer is selected from the following group of compounds: DADMAC and epi-dma.

Claim 24 (Currently Amended): A process of removing suspended and dissolved protein-containing material from a continuous stream of fruit and vegetable wastewater comprising the steps of:

adding continuously a stream of the wastewater to a tank;

adding simultaneously to the wastewater in the tank, an inorganic coagulant polymer and a synthetic organic polymer produce a stream of treated solution containing treated liquid and nontacky solid particles having a size ranging from 15 to 150 microns, wherein the synthetic organic polymer is added in an amount between a 5:1 and 25:1 ratio of inorganic coagulant polymer to synthetic organic polymer;

separating the solid particles from stream of treated solution by settling to produce a stream of treated liquid; and

passing the stream of treated liquid through a microfiltration membrane to collect residual solid particles and a stream of filtered liquid, wherein the separated solid particles comprise protein.

Claim 25 (Original): The process as recited in claim 24, wherein the coagulant polymer is selected from the following group of compounds: an aluminum based compound having a charge of +3, an iron compound having a charge of +3 and a calcium compound.

Claim 26 (Previously Presented): The process as recited in claim 24, wherein the synthetic organic polymer is selected from the following group of compounds: DADMAC and epi-dma.

Claim 27 (Original): The process as recited in claim 24, wherein the step of adding coagulant and synthetic organic polymers has a dwell time between 5 and 30 minutes.

Claim 28 (Cancelled).

Claim 29 (Cancelled).

Claim 30 (Original): The process as recited in claim 24, wherein the residual solid particles collected on the filter membrane act as a separate filter that filters out other residual solid particles and as the residual solid particles accumulate on the filter membrane a fluid flow through the filter membrane is not significantly reduced.

Claim 31 (Original): The process as recited in claim 24, wherein the wastewater flows through the filter membrane from the outside of the filter membrane to the inside of the filter membrane.

Claim 32 (Currently Amended): A process of removing suspended and dissolved protein-containing material from a continuous stream of fruit and vegetable wastewater comprising the steps of:

adding continuously the wastewater to a tank;

adding simultaneously to the wastewater in the tank:

an inorganic coagulant polymer and a synthetic organic polymer to produce a stream of treated solution containing treated liquid and nontacky solid particles having a size ranging from 15 to 150 microns, wherein the coagulant polymer is selected from the following group of compounds: an aluminum based compound having a charge of +3, an iron compound having a charge of +3, and a calcium compound, wherein the synthetic organic polymer is selected from the following group of compounds: DADMAC and epi-dma;

separating the solid particles from the stream of treated solution by settling to produce a stream of treated liquid, ~~wherein the synthetic organic polymer is selected from the following group of compounds: DADMAC and epi-dma;~~ and

passing the stream of treated liquid through a microfiltration membrane to collect residual solid particles and a stream of filtered liquid, membrane to act as a separate filter for other residual solid particles and as the residual solid particles accumulate on the membrane the fluid flow through the filter membrane is not significantly reduced, wherein the separated solid particles comprise protein.

Claim 33 (Original): The process as recited in claim 32, wherein the step of adding coagulant and synthetic organic polymers has a dwell time between 5 and 30 minutes.

Claim 34 (Cancelled).

Claim 35 (Cancelled).

Claim 36 (Currently Amended): ~~The~~[[A]] process ~~of removing suspended and dissolved material from fruit and vegetable wastewater~~ as recited in claim 1, wherein the filtered solid particles contain less than 3% bound water.

Claim 37 (Currently Amended): ~~The~~[[A]] process ~~of removing suspended and dissolved material from a continuous stream of fruit and vegetable wastewater~~ as recited in claim 32, wherein the filtered solid particles contain less than 3% bound water.

Claim 38 (Currently Amended): ~~The~~[[A]] process ~~of removing suspended and dissolved material from fruit and vegetable wastewater~~ as recited in claim 1, wherein the microfiltration membrane is a low pressure membrane that operates at pressures less than 24 psi.

Claim 39 (Currently Amended): ~~The~~[[A]] process ~~of removing suspended and dissolved material from fruit and vegetable wastewater~~ as recited in claim 32, wherein the microfiltration membrane is a low pressure membrane that operates at pressures less than 24 psi.

Claim 40 (New): The process as recited in claim 1, wherein the separated solid particles comprise at least 50% protein.

Claim 41 (New): The process as recited in claim 1, further comprising the step of collecting the separated solid particles for as an animal feed additive.

Claim 42 (New): The process as recited in claim 1, further comprising the step of collecting and retaining the separated solid particles for subsequent lycopene extraction.